NUCLEONICA:
Mass Activity Calculator

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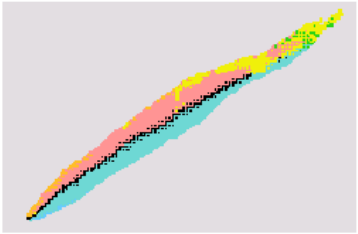
Nuclear science applications…

nucleonica … web driven nuclear science

Applications | My Preferences | Help

Nuclide Explorer



» Actual Chart: Karlsruhe

Search Nucleonica Documentation

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Nuclear Data Retrieval

nucleonica [wiki]

Application Centre

- Mass Activity Calculator
- Decay Engine
- Dosimetry & Shielding
- Range & Stopping Power
- webKORIGEN
- Universal Nuclide Chart
- Transport & Packaging
- Nuclide mixtures
- Nucleonica Scripting
- Library creation for 3rd party software
- Radiological Dispersion Module
- Extended Graph Module

Data Centre

- Physical Constants
- Nuclide Datasheets
- Nuclide Derived Data
- Average Cross Sections
- Radiations
- Prompt Gamma
- Fission Yields

Knowledge Centre

- Nuclear News
- Reading room
- Useful Weblinks
- Ask An Expert
- Element Information
- Conference Calendar

Welcome, Joe

Edit Preferences | Administration

MyCommunity Portal

My Last Nuclides

- 90 Th232
- 90 Th231
- 94 Pu239
- 92 U235
- 25 Mn52

My Nuclide Mixtures

- Pu238+daughter (100g @50y)
- Natural Uranium
- Cs137 + Ba137m
- U232+Co60
- Transuranics in 1 ton Spent Fuel (4.2% enriched, 50GWd/t, 6 years cooling)

My Sources

- Pu239 1 g
- natu

My Messages

- Thanks!
- About my group and information
- Photo Change
- Open call for JRC Traineeships at the Institute for Transuranium Elements
- NAMLS-9 International Conference on Nuclear Analytical Methods in the Life Sciences

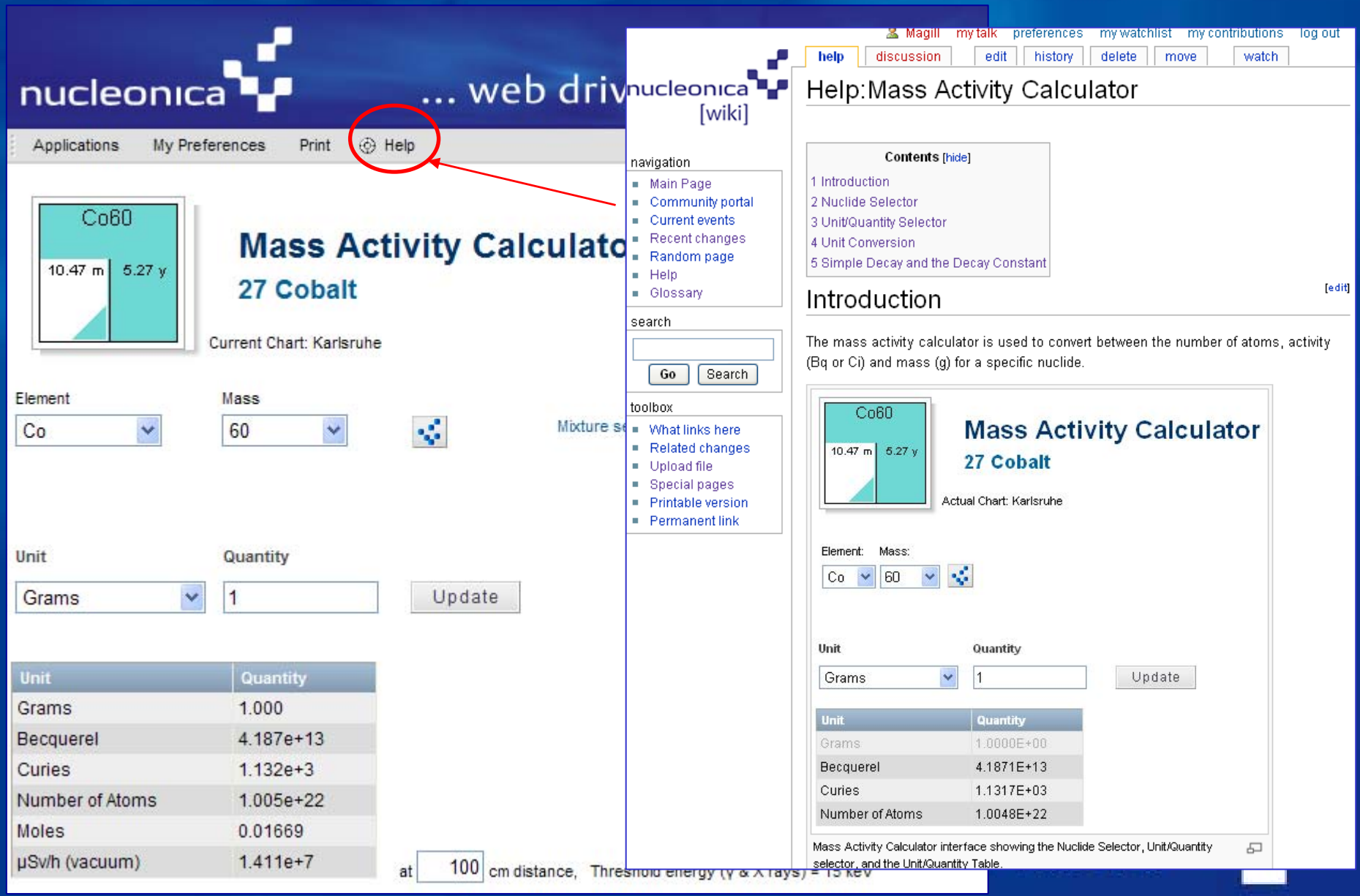
» View

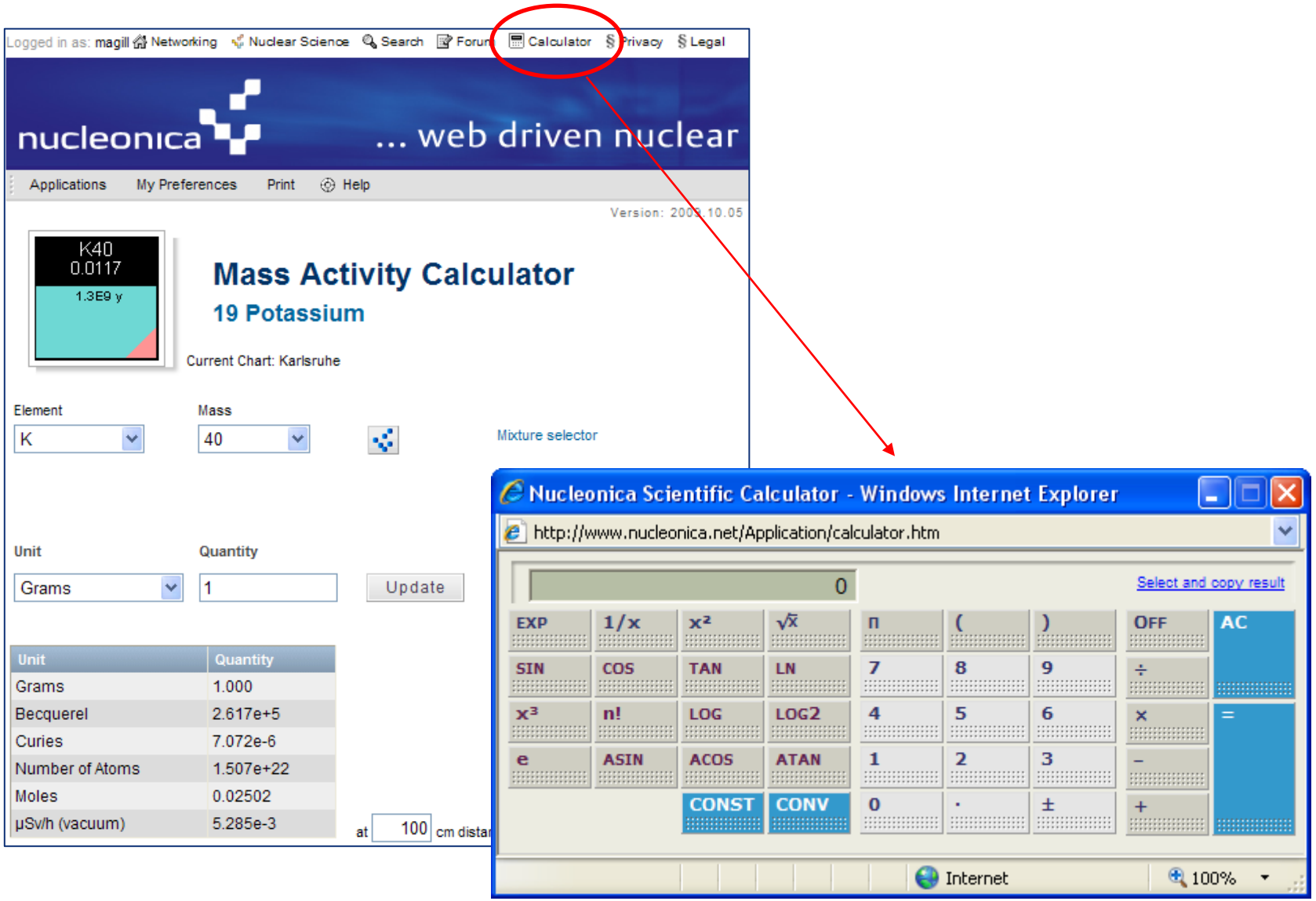
User Alerts

- Task completed (DecayEngine: Uranium 238)

» View

Example of a simple NUCLEONICA application: The Mass-Activity Calculator

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Applications My Preferences Print Help
Version: 2009.10.05
K40
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Mass Activity Calculator
19 Potassium
Current Chart: Karlsruhe
Element
K
Mass
40
Mixture selector
Unit
Grams
Quantity
1
Update
Unit
Quantity
Grams
1.000
Becquerel
2.617e+5
Curies
7.072e-6
Number of Atoms
1.507e+22
Moles
0.02502
μSv/h (vacuum)
5.285e-3
at
100
cm distar
Nucleonica Scientific Calculator - Windows Internet Explorer
http://www.nucleonica.net/Application/calculator.htm
0
Select and copy result
EXP 1/x x² √x n ( ) OFF AC
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Exercises! Mass-Activity Calculator

1. Calculate the specific activities of C-14 and S-35?
2. The activity of Sr-90 is 18,000 transformations per minute. What is the mass of Sr-90?
3. 6 g of carbon from a piece of wood found in an ancient temple is analyzed and found to have an activity of 10 transformations per minute per gram (from C-14). How many atoms of C-14 are present in the sample and what is their mass?
4. The concentration of potassium (K) in humans is about 1.7 g/kg. How much potassium does an average person (weight 80 kg) contain? What is the abundance of K-40 in natural potassium?. What is the mass and activity of K-40 in this person?
5. What is the dose rate from a 100 MBq source of Co-60 at 2m distance?

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Exercises! Mass-Activity Calculator

1. Calculate the specific activities of C-14 and S-35? (1.7E11 Bq/g (4.5 Ci/g), 1.6E15 Bq/g (4.3E4 Ci/g)).
2. The activity of Sr-90 is 18,000 transformations per minute. What is the mass of Sr-90? (Ans. mass = 5.88E-11g).
3. 6 g of carbon from a piece of wood found in an ancient temple is analyzed and found to have an activity of 10 transformations per minute per gram (from C-14). How many atoms of C-14 are present in the sample and what is their mass? (2.6E11 atoms, mass = 6.0E-12 g)
4. The concentration of potassium (K) in humans is about 1.7 g/kg. How much potassium does an average person (weight 80 kg) contain? (136 g). What is the abundance of K-40 in natural potassium?. What is the mass and activity of K-40 in this person? (0.0117%,1.59E-2 g, 4.2 kBq).
5. What is the dose rate from a 100 MBq source of Co-60 at 2m distance?(8.4 µSv/h)

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